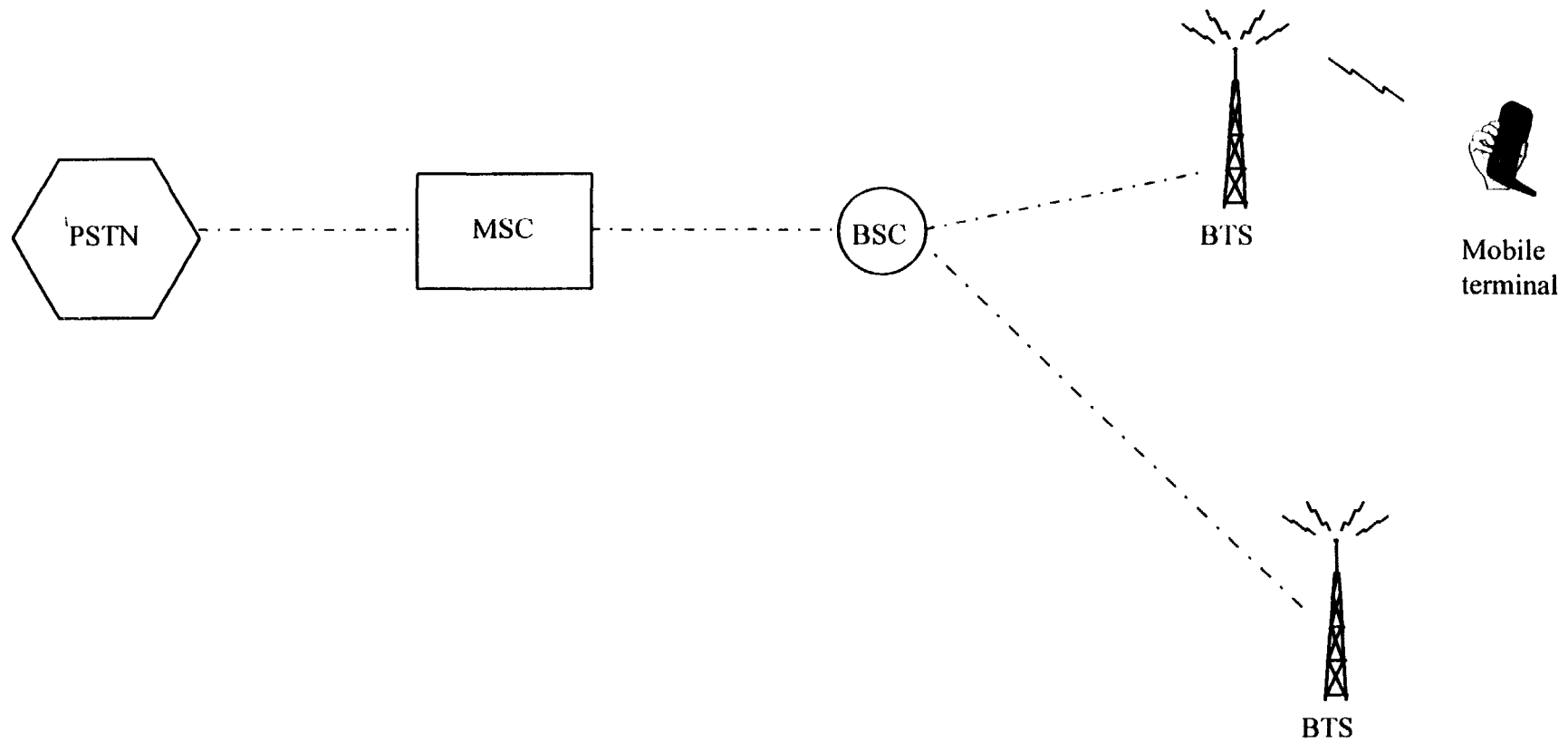


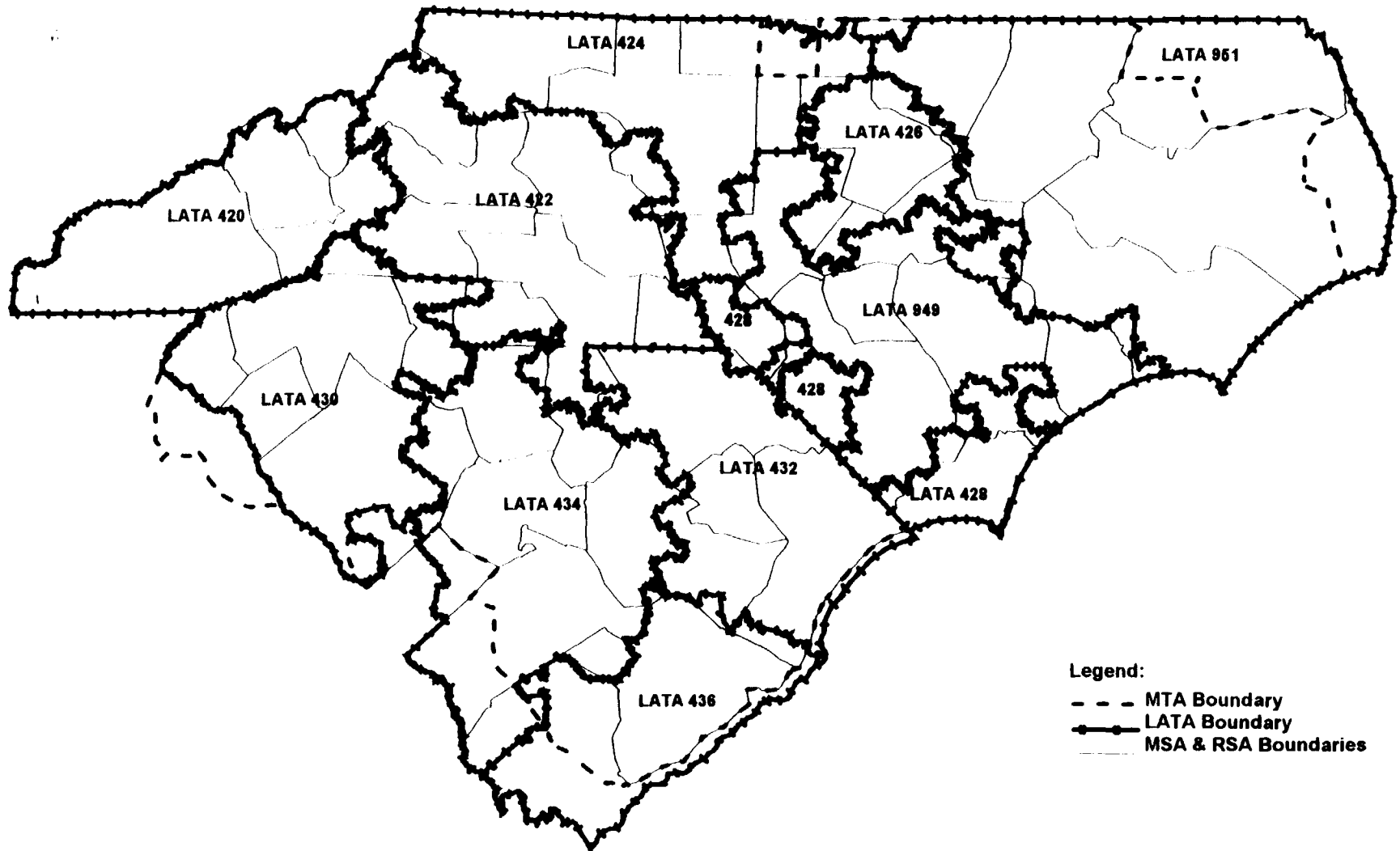
PCS-1900 Network Schematic

Exhibit 2



PSTN = Public Switched Telephone Network
MSC = Mobile Switching Center
BSC = Base Station Controller
BTS = Base Transceiver Station

Exhibit 3 - Carolina MTA With LATA, MSA & RSA Boundaries



IN THE
UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

UNITED STATES OF AMERICA,

Plaintiff,

v.

WESTERN ELECTRIC COMPANY, INC.
AND AMERICAN TELEGRAPH AND
TELEPHONE COMPANY,

Defendant.

Civil No. 82-0192 (HHG)

AFFIDAVIT OF THOMAS E. WHEELER

I, Thomas E. Wheeler, being first duly sworn, state that:

1. I submit this affidavit as President and Chief Executive Officer of the Cellular Telecommunications Industry Association ("CTIA") in support of the request of the Regional Bell Operating Companies ("RBOCs") for a ruling establishing the RBOCs' freedom under the MFJ to offer their PCS customers the same intersystem hand-off services that RBOC and non-RBOC cellular carriers have offered for many years.

2. CTIA was established in 1984 as the trade association of the cellular industry. Today, CTIA represents the entire wireless industry. Membership is open to all carriers that provide commercial mobile radio services. CTIA's members include over 95 percent of the licensees providing cellular services to the United States, Canada, and Mexico, as well as holders of newly issued PCS licenses and the nation's largest providers of enhanced specialized mobile radio

(“ESMR”) service. CTIA’s membership also includes wireless equipment manufacturers, support service providers, and others with an interest in the wireless industry.

3. CTIA’s Board of Directors has voted unanimously against the imposition of the MFJ’s interexchange restriction and equal access obligations on providers of wireless services since these MFJ requirements harm consumers and all cellular carriers by inhibiting the provision of “seamless” services and new technologies. The existing intersystem hand-off waiver for cellular services helps ameliorate these concerns. CTIA and its members have a direct and vital interest in securing similar relief for the RBOCs’ PCS services.

4. In October 1990, CTIA formally adopted a technology platform that included as one of its three key goals for the wireless industry that “the vision of seamless North American cellular service should be realized by adopting and implementing the IS-41 standard as quickly as possible.” Realization of seamless wireless services that enable customers to make and receive cellular calls anywhere and at any time without regard to system boundaries remains a key goal of CTIA.

5. In order to further the goal of seamless service, CTIA and its members have worked with network equipment manufacturers and TIA to develop IS-41. IS-41 is an industry technical standard allowing wireless systems manufactured by different suppliers and serving different geographic areas to communicate with one another. When utilized by two adjoining systems, this standard allows for transfer (or “hand-off”) of ongoing calls across system boundaries. IS-41 also allows other capabilities, for example, automatic delivery of calls to wireless customers wherever they happen to be.

6. Efforts to develop IS-41 began in 1985 in response to the inability of cellular switches manufactured by different vendors to communicate with one another. While subscribers driving into an adjacent cellular system could sometimes enjoy uninterrupted calling if both systems used the same switch vendors, their call would be dropped if their switches were not the same. Customers, being unaware of this technical problem and of invisible system boundaries, would conclude that their phone or service had failed. The IS-41 standard was created to provide the uninterrupted calling cellular customers expected. The equipment and systems necessary to provide seamless cellular service through IS-41 have now been deployed throughout the nation. As of July 21, 1995, approximately 85 percent of cellular systems have deployed IS-41.

7. PCS carriers, just like cellular carriers, will use the IS-41 standard, or a similar European standard, to enable their customer to make and receive calls "any time, anywhere." Indeed, PCS providers must be able to realize the full benefits of IS-41 technology in order to attain the industry-wide goal of a nationwide, seamless network. The ultimate value of wireless calling is the ability to make and receive calls anywhere without effort beyond that necessary to place or receive calls at home. To the subscriber, services like call hand-off and call delivery lend wireless communications a transparency that overcomes the fact that there are a large number of wireless carriers and markets through the country. They will allow PCS providers to provide seamless nationwide service, despite technical limitations, licenses boundaries, and MFJ restrictions that require the fragmentation of PCS networks.

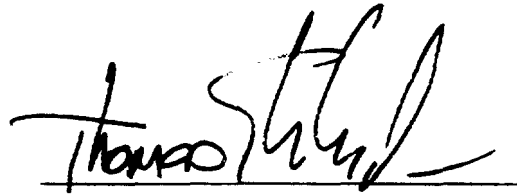
8. Applying MFJ restrictions on call hand-off across LATA boundaries to PCS would rule out seamless calling for a large segment of the wireless industry. In fact, interLATA call hand-offs may come into play more frequently

for PCS than for traditional cellular services since the PCS license areas (“MTAs” and “BTAs”) often cross state lines and are larger than cellular license areas and thus are criss-crossed by more LATA boundaries. Seamless hand-off of calls within and beyond individual MTAs is just as important to PCS customers as to customers of existing cellular services. PCS customers have the same need to communicate without interruption.

9. Indeed, PCS and traditional cellular will be compatible, as well as competitive services; they are likely to serve the same group of customers. Those customers might well choose an existing cellular carrier, or another PCS carrier, if RBOC PCS providers are unable to offer seamless service. That obviously would harm RBOC PCS providers, who collectively will have invested billions of dollars to acquire PCS licenses and initiate service. It also would harm consumers, who would be denied higher-quality, lower-cost services due to diminished competition among cellular and PCS providers. And it would harm the public generally, because the radio spectrum allocated to PCS by the FCC would not be put to its best use.

10. Denying RBOC PCS carriers the ability to offer intersystem hand-off would injure all wireless service providers. Intersystem hand-off frequently involves voice and data communications links between the systems of different carriers. Without permission to participate in such hand-off, RBOCs would be unable to provide continuous service to customers who travel into their service area after initiating a local call over another carrier’s adjacent wireless system. The caller would have to re-initiate the call after crossing the system boundary. The losers would be non-RBOC providers and all wireless customers.

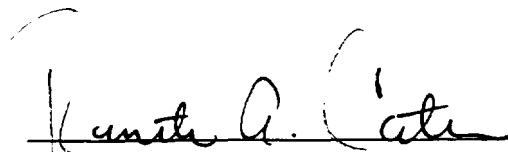
11. Likewise, customers of non-RBOC carriers who use RBOC PCS systems as roamers could not have their calls handed off across LATA boundaries, making the roaming service offered by their home carrier (which could be another PCS provider or a traditional cellular carrier) that much less attractive. In other words, limiting the RBOCs' ability to offer intersystem hand-off will harm the entire wireless industry by limiting its ability to provide consumers the high-quality service and calling freedom IS-41 allows.



Thomas E. Wheeler

President and Chief Executive Officer
Cellular Telecommunications Industry
Association

Subscribed and sworn to before me this 22nd day of August, 1995.



Notary Public

My commission expires August 22, 1997

AFFIDAVIT**INTRODUCTION**

Thomas Ginter, being duly sworn, deposes and says:

1. I am currently the Sr. Staff Technical Standards Engineer coordinating activities related to ANSI accredited Telecommunications Industry Association TR46 "Mobile & Personal Communications 1800 Standards" at the Radio Systems Division of Ericsson, Inc., located in Richardson, Texas (hereinafter "Ericsson"). In this capacity, I am responsible for Ericsson's participation and position in TR46 relating to 1800 PCS activities. Further, I am Chairman of TR46.2 Working Group 2 on "Personal Communications Network to Personal communications Network Intersystem Operations" which develops standards for both IS-41-based and IS-652-based ("GSM-based") network technology. Formerly, I held the Chairman position in TR45.2 Intersystems Operations Standards Working Group 3 on Hand-off (IS-41-based) from September, 1992 to January, 1995. As part of this responsibility, Ericsson has consistently provided representation at meetings of TIA/EIA, TR45 and TR46 Committees, T1 Committees, and other industry forums. I have worked at Ericsson since 1991. I received my Bachelor's degree in Electrical Engineering from the University of Calgary in Canada in 1986.
2. Dan Westin has previously provided an affidavit in support of the waiver request of various RBOC cellular carriers for intersystem hand-off. In that affidavit, a copy of which is attached as Exhibit A, Dan Westin explained the then current state of hand-off technology as it existed in 1991. Ericsson will in this affidavit discuss its best understanding of changes to the technical issues related to the provisioning of presubscribed equal access during handoff using IS-41 for both 800 MHz and 1900 MHz cellular operations, as well as for the use of IS-652 at 1900 MHz PCS operations, since the original 1991 affidavit. In addition to the above, the portions of Exhibit A which provide information on "Trunk Provisioning" and "Network Control Signaling" are updated within this affidavit. Where differences are identified between this affidavit and Exhibit A, this affidavit, overrides the previously known information.
3. Ericsson manufactures switches used in mobile telephone switching offices (MTSOs) for systems operating either in the 800 MHz (standard cellular) or the 1900 MHz (Personal Communications Service PCS) frequency bands. Accordingly, Ericsson is cognizant of the capacities and limitations of mobile telephone switches in providing inter-system hand-off and automatic call delivery in both the 800 MHz and 1900 MHz frequency bands. Ericsson systems have (in the U.S.) provided inter-system hand-off functionality since 1988 and automatic call delivery since 1987. Ericsson also produces tandem switches for inter-exchange carriers. In addition, Ericsson produces systems that operate in the 800 MHz "cellular" band and for the 1900 MHz "PCS" band. The concerns and issues which Mr. Westin related in Exhibit A regarding equal access hand-offs in cellular, apply equally to hand-offs in the PCS environment. Indeed, the PCS environment is a far more rigorous technical challenge in light of the numerous technologies (i.e., GSM, CDMA, TDMA) which may be utilized by various carriers.

INTER-SYSTEM HAND-OFF

4. As detailed in Exhibit A, Ericsson states that intersystem handoff requires dedicated trunking facilities. These statements remain accurate and apply equally to IS-41-based signaling and IS-652-based signaling.

The requirements on inter-system hand-off timing efficiency have increased with the introduction of the IS-54B, IS-136, and PCS-1900 (J-STD-007) digital air-interface standards. With digital hand-offs, the requirements of a timely set-up of inter-system trunks are increased drastically due to the much quicker deterioration of signal quality than with current analog air-interface standards. These timing requirements supersede any known development in alternative hand-off routing techniques. Due to propagation characteristics, systems at 1900 MHz will be affected more than a system at 800 MHz with equivalent system configurations. It is important to reiterate the point that when a mobile station is on a deteriorating channel, it can not handoff to the new quality channel until the handoff trunk is established between serving system and the target system. Any delay in the acquisition of the handoff trunk will increase the moment-to-moment probability of the deteriorating channel decaying to a point where the mobile station simply drops the call.

The introduction of digital access techniques in IS-54B, IS-136 and PCS-1900 (J-STD-007) places stringent timing requirements on the type of inter-system trunk used for hand-off. Dedicated trunking can accommodate these timing requirements. A dedicated trunk is a trunk that has already had a setup process performed prior to a call. This trunk remains connected on both the serving and target system side, and is immediately available for use when a mobile station requires a handoff. This applies to 800 MHz and equally, or more so, to 1900 MHz applications and is independent of choice of IS-41 or IS-652 MAP.

5. The time it takes to set-up general non-dedicated trunks would be excessive even within the current analog air-specification. For example, it is Ericsson's belief that even with a full telephony network upgrade to state-of-the-art ISUP signaling connections between each node involved in an interexchange Hand-off, including Serving Cellular/PCS Switch, Serving End Office, Serving Access Tandem, Interexchange Carrier, Target Access Tandem, Target End Office, and Target Cellular/PCS Switch, that the network delays would exceed the associated Hand-off time requirements.

It is therefore Ericsson's best understanding that inter-system hand-off requires dedicated trunking facilities. This statement is made in the light that the PIC and interexchange carrier trunk selection are provided for incoming and outgoing calls even when a handoff must occur on that call -- it is only the handoff facility that is unable to be routed via equal access.


TRUNK PROVISIONING

6. As detailed in Exhibit A, Ericsson's system supports the provisioning of the actual alternative routing (per PIC) for the call delivery leg of a call termination to a cellular subscriber. Ericsson systems now support origination in any system using a PIC. This applies to both Ericsson specific signaling and when using an inter-vendor open standard (i.e., IS-41 or IS-652).

NETWORK CONTROL SIGNALING

7. As detailed in Exhibit A, Ericsson states that it would not be technically feasible to use the subscriber's PIC to support the network control signaling needed to perform call delivery. These statements remain accurate and apply equally to IS-41-based signaling and IS-652-based signaling.

By:


Thomas Ginter

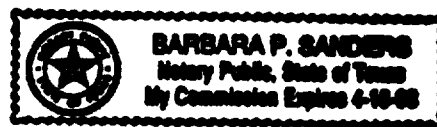
NOTARY

State of Texas

County of Dallas

Sworn to and subscribed before me on 8th day of September, 1995.

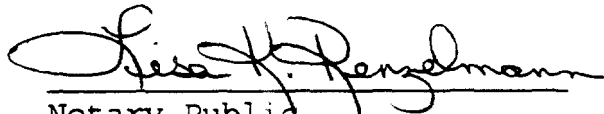

Barbara P. Sanders



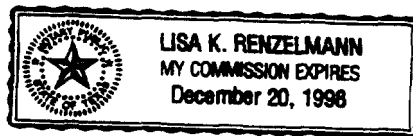
I certify that the attached Affidavit from Thomas
Ginter is a true and accurate copy of the original.

State of Texas

County of Dallas


Notary Public

09/20/95
Date



AFFIDAVIT

INTRODUCTION

Dan M. Westin, being duly sworn, deposes and says:

1. I am currently manager of product planning at Ericsson Radio Systems, Inc. located in Richardson, Texas (hereinafter "Ericsson"). In this capacity, I am responsible for systems planning of Ericsson's present and future cellular telecommunications system. As part of this responsibility I arrange for Ericsson representation at meetings of TIA/EIA TR45 Committees, T1 Committees, ITCF and other industry forums. I have worked at Ericsson since 1982. I received my M.S. degree in Electrical Engineering from Chalmers University of Technology, Gothenburg, 1983 and a Masters degree in Business Administration from the University of Chicago 1990.
2. I have participated in the TIA/EIA TR45.2 work on IS-41 since 1988 and one of my staff members is currently chair of working group III in the TR45.2 subcommittee. The purpose of this affidavit is to provide Ericsson's view on the issues set forth in the affidavit of Mr. John A. Marinho, Chairman of the TR 45.2 subcommittee. Ericsson supports Mr. Marinho's reporting of the understandings in the subcommittee with regards to presubscription for inter-system handoff and with regards to presubscription for the administrative support of call delivery. Ericsson will in this affidavit discuss its best understanding of the technical issues related to the provisioning of presubscribed equal access using IS-41.
3. Ericsson manufactures switches used in mobile telephone switching offices (MTSOs). Accordingly, Ericsson is cognizant of the capacities and limitations of mobile telephone switches in providing intersystem handoff and automatic call delivery. Ericsson systems have (in the US) provided inter-system handoff functionality since 1988 and automatic call delivery since 1987. Ericsson also produces tandem switches for inter-exchange carriers.

INTERSYSTEM HANDOFF

4. There are several issues that need to be addressed with regards to the possibilities and limitations on alternative routing of inter-system handoffs. In fact, Ericsson has described several key considerations in contribution TR45.2.3/91.02.05-5. As the contribution describes there are several areas of standardization that would require study for the feasibility of provisioning of selective routing of inter-system handoffs.

The issue of speed considerations on the handoff has been duly described earlier; the key issue being the time to set-up trunks through other switching nodes in the network. As this application has very distinct requirements, these interfaces would have to be specific as to their performance and implementation. The time it takes to set-up general non-dedicated trunks would be excessive even with the current analog air-specification.

The requirements on inter-system handoff timing efficiency will increase with the introduction of the digital air-interface standard. With digital handoffs the requirements of a timely set-up of inter-system trunks are increased drastically due to the much quicker deterioration of signal quality than with current analog air-interface standards. These timing requirements supersede any known development in alternative routing techniques.

The introduction of digital techniques also places stringent requirements on the type of inter-system trunk for the actual inter-system functionality for the provisioning of a handoff.

Examples here are bit-error performance and digital line synchronization which would be severely impaired by the introduction of non-dedicated trunks in the handoff process. It is anticipated that the growing end-user service requirements will increase the requirements on the inter-system trunks. Any allocation of specific type of resources for non-dedicated usage would likely be highly inefficient from a systems dimensioning point of view.

It is therefore Ericsson's best understanding that inter-system handoff requires dedicated trunking facilities.

5. With regards to pre-subscribed equal access for call delivery, there are several issues to be considered.

It is very important to separate the requirements on the cellular standards with regards to the actual subscribers pre-subscription possibilities. There are two separate areas, trunk provisioning and network control signaling.

TRUNK PROVISIONING

The provisioning of the actual alternative routing (per PIC) for the call delivery leg of a call termination to a cellular subscriber is supported by IS-41. Ericsson's cellular system supports this today and has done so since 1988. The requirement for this function to work is obviously that the subscribers' PIC actually provides trunk services between home and visited system.

The case of a subscriber being able to use the PIC for origination in a visited system is also possible (although not in service) in Ericsson's cellular system. The requirement here is obviously that the PIC performs services in the visited system.

NETWORK CONTROL SIGNALING

Cellular systems require a network support of inter-system interactions that are basic to the provisioning of any mobility-based service. These interactions are transparent to the subscribers' use of the service and are primarily required for the switch-to-switch network control. Examples of this are; routing number in the visited system, validation of the subscribers identity, and service status. A visited system may, for instance, send a status change to the home system on a

subscriber that has become inactive in the visited system in order for the home system to handle the incoming calls more efficiently (reduces trunk usage for non-completed calls). These signaling functions are not accessible to the subscriber as they are solely operator-related and the subscriber is also not aware of these interactions as they happen before a subscriber initiates any activity in a visited system.

There are also cases in the network control process where the visited system does not have any subscriber record on the cellular visitor and, therefore, would not be able to take any action based on the subscribers record. One such case is when the subscriber first registers in the visited system.

Generally, the requirements on the network control signaling support for mobility functions places stringent requirements on the nodes involved in the signaling and the interfaces between them. As the subscriber moves around in a network with a growing number of nodes, it becomes excessively complex to manage administrative and analysis functions in order to determine a subscriber's home system. Therefore, these signaling interfaces need to be clearly established and prepared so that a uniform call process quality can be maintained.

In light of the foregoing, it is Ericsson's opinion that it would not be technically feasible to use the subscriber's PIC to support the network control signaling needed to perform call delivery.

By: 

NOTARY

State of Texas
County of Dallas

Sworn to and subscribed before me on the 17th day of
April, 1991.


Notary Public Signature

STATE OF ILLINOIS

COUNTY OF COOK

AFFIDAVIT OF DONALD A. BARNES
MOTOROLA, INC.

Donald A. Barnes, being duly sworn, deposes and says:

1. I am currently Engineering Manager, IS-41 Development, responsible for implementation of the IS-41 standard. I have twenty-five years of telecommunications experience, including eighteen years at GTE in CO and PBX systems development, and the last seven years at Motorola.

2. I am currently actively involved representing Motorola to the EIA/TIA 45.2 subcommittee of the Telecommunications Industry Association. I have provided contributions and participated in working groups to define the IS-41 standard. I also am currently active in the TR46.2 subcommittee that is defining the interoperations of Personal Communication Service, or PCS, with existing cellular networks using the IS-41 standard. The purpose of this affidavit is to confirm that, with IS41 it is not possible for PCS providers to use a customer's Presubscribed Interexchange Carrier (PIC) either to effectuate intersystem handoff or to exchange the administrative information necessary for automatic call delivery.

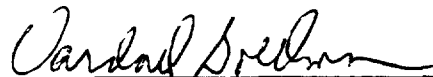
3. I have previously provided an affidavit in support of the waiver request of various RBOC cellular carriers for intersystem handoff. In that affidavit, a copy of which is attached as Exhibit 1, I explained the state of handoff technology as it existed in 1991. I also explained that

there is no technical basis to support the handoff of cellular calls to the Public Switch Network using the customer's presubscribed interexchange carrier.

4. Not only is Motorola the provider of switches used in Mobile Telephone Switching Offices to be utilized with cellular service, but Motorola also provides switches to be used in the provision of PCS. The issues and concerns which I related in Exhibit 1 regarding equal access handoffs in cellular apply to handoffs in the PCS environment. It is no more feasible for a PCS carrier utilizing IS-41 to handoff calls on an equal access basis than it is for a cellular carrier using IS-41 to do so. In relevant respects, PCS and cellular technologies are the same. Indeed, if there is any material technical difference between traditional cellular and PCS, it is that handoff in the PCS environment is a far more rigorous technical challenge in light of the numerous technologies (i.e. GSM, CDMA, TDMA) which may be utilized by various carriers.


Donald A. Barnes

Subscribed and sworn to before me this 22 day of September, 1995.


Notary Public
State of Illinois



**AFFIDAVIT OF DONALD A. BARNES
MOTOROLA, INC.**

Donald A. Barnes, being duly sworn, deposes and says:

1. I am currently Engineering Manager, IS-41 Development, responsible for implementation of the IS-41 standard. I have twenty-one years of telecommunications experience including eighteen years at GTE in CO and PBX systems development, and the last three years at Motorola.

2. I am currently an active representative for Motorola on the EIA/TIA 45.2 subcommittee of the Telecommunications Industry Association. I have provided contributions and participated in working groups to define the IS-41 standard. The purpose of this affidavit is to express Motorola's complete agreement with the affidavit of John A. Marinho, Chairman of the TR 45.2 subcommittee, and to confirm that, with IS-41, it is not possible to use a customer's presubscribed interexchange carrier (PIC) either to effectuate intersystem handoff or to exchange the administrative information necessary for automatic call delivery.

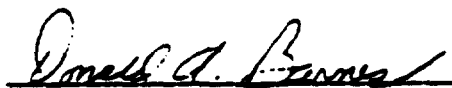
3. Motorola manufactures switches used in mobile telephone switching offices (MTSOs). Accordingly, Motorola is well aware of the capacities and limitations of mobile switches in providing intersystem handoff and call delivery. Motorola fully agrees with the description of both services in Mr. Marinho's affidavit and with his description of the IS-41 standard that makes these services possible between switches made by different manufacturers.

4. As Mr. Marinho explains, it is neither feasible nor practical to provide intersystem handoff if the call must be routed through the landline exchange and carried by the customer's presubscribed interexchange carrier (PIC). Direct links between the two mobile telephone switching offices (MTSOs) must be established if the call is to be transferred quickly enough to avoid disconnection. Routing the call through the landline network would be much too slow, needlessly complicated, and would serve no legitimate purpose. The current industry standard for intersystem handoff, IS-41, is not designed for, and would not support, transfer of the call through the public switched network using the customer's PIC. Thus, it is not currently possible to route calls in that way using a Motorola switch of which I am aware. I do not know of any anticipated developments in switch technology that would make such routing possible in the future.


5. It is not feasible or practical to provide automatic call delivery if the roaming customer's PIC must carry the requisite customer profile information from the customer's home system to the system where that customer is temporarily located. The visited system cannot use the customer's PIC when it queries his home system, because part of the purpose of the query is to find out who the PIC is. The visited system will not know that information in advance. And the home system's response must be returned via the same network as the query in order for the response to be correlated with the query. The industry standard for making these communications simply does not allow for use of the customer's PIC and it would make no sense to engineer the network in that way. Accordingly, Motorola switches are not designed to have the administrative information necessary for call delivery carried by an interexchange carrier.

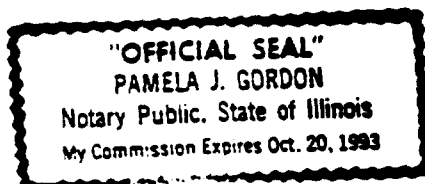
Nor are any other switches of which I am aware. Furthermore, I do not know of any anticipated developments in switch technology that would make such routing possible in the future.

6. Through participation in the TR 45.2 subcommittee and subsequent business relationships with the cellular carriers, more specifically the cellular carriers affiliated with the Regional Bell Operating Companies, the subcommittee and the various vendors, including Motorola, have been encouraged to promptly devise intersystem standards to facilitate handoff and call delivery. Throughout this process, the RBOC cellular carriers have encouraged the implementation of the standard in such a way as to comply with the Modification of Final Judgment. Primarily as a result of the efforts of these cellular carriers, the IS-41 standard as prepared by the TR 45.2 subcommittee and as described in the affidavit of John A. Marinho contemplates the fullest possible utilization of a cellular customer's chosen interexchange carrier. Specifically, the IS-41 standard supports use of the customer's PIC to complete interexchange calls originated by the customer while roaming. If while roaming, the customer's call must be handed off to yet another system, the originally established use of the PIC is maintained in conjunction with preestablished trunk connections between the two systems. This same approach is used when the customer, while in the home market, originates a call involving the PIC and the customer is subsequently handed off to an adjacent system. Furthermore, the standard supports the use of the customer's PIC in the call delivery process.


Donald A. Barnes

Subscribed and sworn to before me
this 17th day of April, 1991.


Notary Public
State of Illinois



UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

UNITED STATES OF AMERICA,)	
Plaintiff,)	
)	
v.)	
)	Civil Action No. 82-0192 (HHG)
WESTERN ELECTRIC COMPANY,)	
INC., and AMERICAN TELEPHONE)	
AND TELEGRAPH COMPANY,)	
)	
Defendants.)	
<hr/>		
STATE OF TEXAS)	
COUNTY OF DALLAS)	

AFFIDAVIT OF HAMID AKHAVAN

Hamid Akhavan, being duly sworn, deposes and says:

1. I am Executive Director -- Network Engineering and Planning of PCS PrimeCo, L.P. ("PrimeCo"), which is headquartered in Dallas, Texas. In this position, I am responsible for PrimeCo's network engineering, planning and design, and ultimately will be involved in the operation and maintenance of the networks over which PrimeCo offers Personal Communications Services ("PCS"). I make this Affidavit in support of the Request of the Bell Companies for an Interpretive Letter or, in the Alternative, a Waiver to Allow InterLATA Handoff of PCS Calls.
2. I have a Bachelor of Science degree from the California Institute of Technology in Electrical Engineering and Computer Science (1988), and a Master of Science Degree from the Massachusetts Institute of Technology in Electrical Engineering and Computer Science (1990). Telecommunications has been the focus of both my undergraduate and

graduate studies, with particular emphasis on network design, analysis and optimization. I also have a patent pending for an integrated land-mobile telecommunication system titled Personal Phone Number System.

3. I began my career in 1987 at the Jet Propulsion Laboratory, a NASA facility, where I worked on deep space radio communication systems for the Voyager and Magellan spacecraft. In 1988, I became a member of Technical Staff at Bell Communications Research where I spent several years in the specification, design, and modeling of the Advanced Intelligent Network ("AIN"). In that role, I developed a landline-based prototype for a Personal Communications System. In 1993, I joined Bell Atlantic Personal Communication Services, Inc. where I served as the Director of Network Planning until coming to PrimeCo in April 1995.
4. In the recent Federal Communications Commission ("FCC") auction of broadband PCS spectrum, which was concluded on March 13, 1995, PrimeCo bid successfully for eleven Metropolitan Trading Areas ("MTAs"): Miami; Tampa; Jacksonville; Richmond; Chicago; Milwaukee; New Orleans; Houston; Dallas/Ft. Worth; and Honolulu. I am now engaged on a day-to-day basis in the design of the systems through which PrimeCo will provide PCS services in these MTAs.
5. PCS is a cellular service which differs from existing cellular services only in the frequency bands over which it will be provided. PrimeCo has selected the Code Division Multiple Access ("CDMA") technology, which recently has been adapted for cellular communications, as the means by which it will deliver its PCS services. The CDMA radio access standard (IS-95), which governs communications between mobile units and PrimeCo's cellular transmitters, relies on the IS-41 standard for call hand-offs, as do existing

cellular systems. Indeed, CDMA will also be used by existing cellular carriers to provide their services.

6. As with existing cellular networks, each of PrimeCo's networks will consist of a series of cell sites and a Mobile Telephone Switching Office ("MTSO"). Each cell site in PrimeCo's systems will re-use frequencies being utilized in other areas of the system and will hand off to and receive calls from other cell sites, as is the case with existing cellular systems. PrimeCo's systems also will operate using the same type of switching technologies and arrangements being used by cellular operators today. PrimeCo's network architecture will thus be identical, for all practical and operational purposes, to the network architecture of existing cellular systems.
7. In addition, the equipment which will be used to provide PCS is the same as that used to provide existing cellular services. Accordingly, the same technical standards now applicable to cellular communications can, and I expect will, be applied to PCS services. These technical standards include the IS-41 standard which makes intersystem hand-off possible.
8. PrimeCo's PCS networks will be physically separated from the landline exchange networks, as well as the landline interexchange networks, as is the case with today's cellular systems. And PrimeCo's systems will connect to the separate landline networks in the same ways that existing cellular networks connect today. PCS providers other than PrimeCo will operate in essentially identical ways.
9. As noted above, and as in other cellular systems, PCS calls are handed-off from one cell site to the next as the mobile customer travels within the system's service area. The same is true when a customer travels from the area served by one MTSO (and its associated cell sites) into an area served